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IN THE CLAIMS

1. (Currently amended) A composite material for the manufacture of electrochemical cell components comprising:

a thermosetting resin system and a conductive filler wherein the thermosetting resin system comprises a polybutadiene or polyisoprene resin and an unsaturated butadiene- or isoprene-containing polymer, and the composite material has a volume resistivity of about 0.116 ohm-cm or less.

2. (Currently amended) The ~~thermosetting resin system~~ composite material of Claim 1, ~~further comprising an unsaturated butadiene- or isoprene-containing polymer, wherein the~~ a volume to volume ratio of the polybutadiene or polyisoprene resin to the unsaturated butadiene- or isoprene-containing polymer is between 1:9 and 9:1, inclusive.

3. (Currently amended) The ~~thermosetting resin system~~ composite material of Claim [[2]] 1, wherein the unsaturated butadiene- or isoprene-containing polymer is a copolymer of isoprene or butadiene and a second monomer.

4. (Currently amended) The ~~thermosetting resin system~~ composite material of Claim [[2]] 1, wherein the unsaturated butadiene- or isoprene-containing polymer is a di-block copolymer.

5. (Currently amended) The ~~thermosetting resin system~~ composite material of Claim 4 wherein the unsaturated butadiene- or isoprene-containing polymer is a styrene-butadiene or α-methyl styrene-butadiene di-block copolymer.

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6. (Currently amended) The ~~thermosetting resin system~~ composite material of Claim 3 wherein the unsaturated butadiene- or isoprene-containing polymer is a thermoplastic elastomer block copolymer having one of the formula

$X_m(Y\text{-}X)_n$, $\left(\begin{matrix} Y \\ | \\ X \end{matrix}\right)_n$, $W_p(Z\text{-}W)_q$, or $\left(\begin{matrix} W \\ | \\ Z \end{matrix}\right)_q$

where in each formula Y is a block comprising isoprene or butadiene units, X is a thermoplastic block, and m and n represent the average block numbers in said copolymer, m being 0 or 1 and n being at least 1; and Z is a polyethylene or ethylene-propylene copolymer block, W is a thermoplastic block, and p and q represent the average block numbers in said copolymer, p being 0 or 1 and q being at least 1.

7. (Currently amended) The ~~thermosetting resin system~~ composite material of Claim [[2]] 1, wherein the unsaturated butadiene- or isoprene-containing copolymer is liquid.

8. (Currently amended) The ~~thermosetting resin system~~ composite material of Claim [[2]] 1, wherein the unsaturated butadiene- or isoprene-containing copolymer is solid.

9. (Original) The composite material of Claim 1 wherein the conductive filler is synthetic graphite.

10. (Currently amended) The ~~thermosetting resin system~~ composite material of Claim 1 further comprising a curing agent.

11. (Currently amended) The ~~thermosetting resin system~~ composite material of Claim 10 wherein the curing agent is an organic peroxide.

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12. (Currently amended) The ~~thermosetting resin system~~ composite material of Claim 11 wherein the curing agent is selected from the group consisting of dicumyl peroxide, di(2-tert-butylperoxyisopropyl) benzene, t-butylperbenzoate, 2,5-dimethyl-2,5-di(t-butyl peroxy) hexyne-3, and combinations thereof.

13. (Currently amended) The ~~thermosetting resin system~~ composite material of Claim 1 wherein the polybutadiene or polyisoprene resin is liquid and has a molecular weight of less than 5,000.

14. (Currently amended) The ~~thermosetting resin system~~ composite material of Claim 1 wherein the polybutadiene or polyisoprene resin is liquid and has a molecular weight of about 1,000 to about 3,000.

15. (Currently amended) The ~~thermosetting resin system~~ composite material of Claim 1 further comprising a functionalized liquid polybutadiene or polyisoprene resin.

16. (Currently amended) The ~~thermosetting resin system~~ composite material of Claim 1 further comprising a low molecular weight polymer resin.

17. (Currently amended) The ~~thermosetting resin system~~ composite material of Claim 1 further comprising at least one crosslinking monomer with vinyl unsaturation.

18. (Currently amended) The ~~thermosetting resin system~~ composite material of Claim 17 wherein the at least one monomer with vinyl unsaturation is selected from the group consisting of styrene, vinyl toluene, divinyl benzene, triallylcyanurate, diallylphthalate, and multifunctional acrylate monomers.

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19. (Original) The composite material of Claim 1, wherein the composite material comprises, based on the total material, about 10 to about 90 volume percent of the conductive filler.

20. (Original) The composite material of Claim 1, wherein all or part of the conductive filler is in the form of fibers, platelets, or a combination of fibers and platelets.

21. (Original) The composite material of Claim 1, wherein the composite material has a volume resistivity of about 0.08 ohm-cm or less.

22. (Original) The composite material of Claim 21, wherein the composite material has a volume resistivity of about 0.04 ohm-cm or less.

23. (Original) The composite material of Claim 1, wherein the composite material has a thermal conductivity of at least about 5 watts/meter °K.

24. (Original) The composite material of Claim 23, wherein the composite material has a thermal conductivity of at least about 7 watts/meter °K.

25. (Original) The composite material of Claim 24, wherein the composite material has a thermal conductivity of at least about 9 watts/meter °K.

26. (Original) An article molded from the composite material of Claim 1, wherein the article has a linear shrinkage per unit length of the molded composite in the X-Y plane of less than or equal to about 0.005.

27. (Original) The article of Claim 26, wherein the linear shrinkage per unit length of the molded composite in the X-Y plane is less than or equal to about 0.003.

28. (Original) The article of Claim 27, wherein the linear shrinkage per unit length of the molded composite in the X-Y plane is less than or equal to 0.001.

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29. (Currently amended) A composite material for the manufacture of electrochemical cell components comprising:

a thermosetting resin system and about 10 vol% to about 90 vol% of conductive filler, based on the total volume of the composite material, wherein the thermosetting resin composition comprises a liquid polybutadiene or polyisoprene resin having a molecular weight of less than about 5,000, and wherein the composite material has a thermal conductivity of at least about 5 watts/meter °K and a volume resistivity of about 0.116 ohm-cm or less.

30. (Original) A method of making a composite material for the manufacture of electrochemical cell components comprising:

making a dilute solution of a thermosetting resin system comprising polybutadiene or polyisoprene resin in a volatile solvent;

slowly adding the dilute solution to a conductive filler; and

mixing to form a homogenous solution.

31. (Currently amended) The method of Claim 30 wherein the thermosetting resin system further comprises an unsaturated butadiene- or isoprene-containing polymer capable of participating in cross-linking with the polybutadiene or polyisoprene resin during cure, and further wherein ~~the~~ a volume to volume ratio of the polybutadiene or polyisoprene resin to the unsaturated butadiene- or isoprene-containing polymer is between 1:9 and 9:1, inclusive.

32. (Original) The method of Claim 31 wherein the unsaturated butadiene- or isoprene-containing polymer is a copolymer of isoprene or butadiene and a second monomer.

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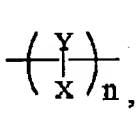
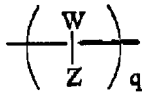
33. (Original) The method of Claim 32 wherein the unsaturated butadiene- or isoprene-containing polymer is a di-block copolymer.

34. (Original) The method of Claim 33 wherein the unsaturated butadiene- or isoprene-containing polymer is a styrene-butadiene or α-methyl styrene-butadiene di-block copolymer.

35. (Original) The method of Claim 32 wherein the unsaturated butadiene- or isoprene-containing polymer is a thermoplastic elastomer block copolymer having one of the formula

$X_m(Y\text{-}X)_n$,  , $W_p(Z\text{-}W)_q$, or 

wherein each formula Y is a block comprising isoprene or butadiene units, X is a thermoplastic block, and m and n represent the average block numbers in said copolymer, m being 0 or 1 and n being at least 1; and Z is a polyethylene or ethylene-propylene copolymer block, W is a thermoplastic block, and p and q represent the average block numbers in said copolymer, p being 0 or 1 and q being at least 1.

36. (Original) The method of Claim 31 wherein the unsaturated butadiene- or isoprene-containing copolymer is liquid.

37. (Original) The method of Claim 31 wherein the unsaturated butadiene- or isoprene-containing copolymer is solid.

38. (Original) The method of Claim 30 wherein the conductive filler is synthetic graphite.

39. (Original) The method of Claim 30 wherein the thermosetting resin system further comprises a curing agent.

40. (Original) The method of Claim 39 wherein the curing agent is an organic peroxide.

41. (Original) The method of Claim 40 wherein the curing agent is selected from the group consisting of dicumyl peroxide, di(2-tert-butylperoxyisopropyl) benzene, t-butylperbenzoate, 2,5-dimethyl-2,5-di(t-butyl peroxy) hexyne-3, and combinations thereof.

42. (Original) The method of Claim 30 wherein the polybutadiene or polyisoprene resin has a molecular weight of less than 5,000.

43. (Original) The method of Claim 30 wherein the polybutadiene or polyisoprene resin has a molecular weight of about 1,000 to about 3,000.

44. (Original) The method of Claim 30 wherein the thermosetting resin system further comprises a functionalized liquid polybutadiene or polyisoprene resin.

45. (Currently amended) The method of Claim 30 wherein the thermosetting resin system further comprises at least one crosslinking monomer with vinyl unsaturation.

46. (Original) The method of Claim 45 wherein the at least one monomer with vinyl unsaturation is selected from the group consisting of styrene, vinyl toluene, divinyl benzene, triallylcyanurate, diallylphthalate, and multifunctional acrylate monomers.

47. (Original) The method of Claim 30, wherein the composite material comprises, based on the total material, about 10 vol% to about 90 vol% of the conductive filler.

48. (Currently amended) A conductive composite material comprising

a thermosetting resin system and about 10 to about 90 volume percent of a conductive filler, based on the total volume of the composite, wherein the thermosetting resin system

comprises a liquid polybutadiene or polyisoprene resin having a molecular weight of less than about 5,000, and further wherein the composite material is formed into an electrochemical cell component having a volume resistivity of 0.116 ohm-cm or less and a linear shrinkage per unit length of the molded composite in the X-Y plane of less than or equal to about 0.005.

49. (Currently amended) A conductive composite material comprising, based on the total volume of the material,

a thermosetting resin system and about 10 to about 90 volume percent of a conductive filler, wherein the thermosetting resin system comprises a polybutadiene or polyisoprene resin and the conductive composite material is formed into an electrochemical cell component having a volume resistivity of about 0.116 ohm-cm or less, a thermal conductivity of at least about 5 watts/meter °K, and a a linear shrinkage per unit length of the molded composite in the X-Y plane of less than or equal to about 0.005.

50. (Currently amended) A bipolar plate formed from the ~~composition~~ composite material of claim 1.

51. (New) A composite material for the manufacture of electrochemical cell components comprising:

a thermosetting resin system, a conductive filler, and a curing agent comprising an organic peroxide, wherein the thermosetting resin system comprises a polybutadiene or polyisoprene resin, wherein the composite material comprises, based on the total volume of the material, about 10 to about 90 volume percent of the conductive filler, and wherein the composite material has a volume resistivity of about 0.116 ohm-cm or less.

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52. (New) The composite material of Claim 51, further comprising an unsaturated butadiene- or isoprene containing polymer, wherein a volume to volume ratio of the polybutadiene or polyisoprene resin to the unsaturated butadiene- or isoprene-containing polymer is between 1:9 and 9:1, inclusive.

53. (New) The composite material of Claim 52, wherein the unsaturated butadiene- or isoprene-containing polymer is a styrene-butadiene or α-methyl styrene-butadiene di-block copolymer.

54. (New) The composite material of Claim 51, wherein the conductive filler is synthetic graphite.

55. (New) The composite material of Claim 51, wherein the curing agent is selected from the group consisting of dicumyl peroxide, di(2-tert-butylperoxyisopropyl) benzene, t-butylperbenzoate, 2,5-dimethyl-2,5-di(t-butyl peroxy) hexyne-3, and combinations thereof.

56. (New) The composite material of Claim 51, wherein the polybutadiene or polyisoprene resin is liquid and has a molecular weight of less than 5,000.

57. (New) The composite material of Claim 51, wherein the polybutadiene or polyisoprene resin is liquid and has a molecular weight of about 1,000 to about 3,000.

58. (New) The composite material of Claim 51, further comprising a functionalized liquid polybutadiene or polyisoprene resin and/or a low molecular weight polymer resin and/or a crosslinking monomer with vinyl unsaturation.

59. (New) The composite material of Claim 51, wherein the composite material has a thermal conductivity of at least about 5 watts/meter °K.

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60. (New) The composite material of Claim 51, wherein the composite material has a volume resistivity of about 0.08 ohm-cm or less and a thermal conductivity of at least about 7 watts/meter °K.

61. (New) The composite material of Claim 51, wherein the composite material has a volume resistivity of about 0.04 ohm-cm or less and thermal conductivity of at least about 9 watts/meter °K.

62. (New) An article molded from the composite material of Claim 51, wherein the article has a linear shrinkage per unit length of the molded composite in the X-Y plane of less than or equal to about 0.005.

63. (New) The article of Claim 62, wherein the linear shrinkage per unit length of the molded composite in the X-Y plane is less than or equal to about 0.003.

64. (New) The article of Claim 62, wherein the linear shrinkage per unit length of the molded composite in the X-Y plane is less than or equal to 0.001.

65. (New) A bipolar plate formed from the composition of claim 51.

66. (New) A composite material for the manufacture of electrochemical cell components comprising:

a thermosetting resin system and 10 to 90 volume percent of a conductive filler, based on the total volume of the composite material, wherein the resin system comprises a polybutadiene or polyisoprene resin and a conductive filler, and wherein the composite material has a thermal conductivity of at least about 5 watts/meter °K and a volume resistivity of about 0.116 ohm-cm or less.

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67. (New) The composite material of Claim 66, further comprising an unsaturated butadiene- or isoprene-containing polymer, wherein a volume to volume ratio of the polybutadiene or polyisoprene resin to the unsaturated butadiene- or isoprene-containing polymer is between 1:9 and 9:1, inclusive.

68. (New) The composite material of Claim 67, wherein the unsaturated butadiene- or isoprene-containing polymer is a styrene-butadiene or α-methyl styrene-butadiene di-block copolymer.

69. (New) The composite material of Claim 66, wherein the conductive filler is synthetic graphite.

70. (New) The composite material of Claim 66, further comprising an organic peroxide curing agent.

71. (New) The composite material of Claim 66, wherein the polybutadiene or polyisoprene resin is liquid and has a molecular weight of less than 5,000.

72. (New) The composite material of Claim 66, wherein the polybutadiene or polyisoprene resin is liquid and has a molecular weight of about 1,000 to about 3,000.

73. (New) The composite material of Claim 66, further comprising a functionalized liquid polybutadiene or polyisoprene resin and/or a low molecular weight polymer resin and/or a crosslinking monomer with vinyl unsaturation.

74. (New) The composite material of Claim 66, wherein the composite material has a volume resistivity of about 0.08 ohm-cm or less and a thermal conductivity of at least about 7 watts/meter °K.

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75. (New) The composite material of Claim 66, wherein the composite material has a volume resistivity of about 0.04 ohm-cm or less and a thermal conductivity of at least about 9 watts/meter °K.

76. (New) An article molded from the composite material of Claim 66, wherein the article has a linear shrinkage per unit length of the molded composite in the X-Y plane of less than or equal to about 0.005.

77. (New) The article of Claim 76, wherein the linear shrinkage per unit length of the molded composite in the X-Y plane is less than or equal to about 0.003.

78. (New) The article of Claim 76, wherein the linear shrinkage per unit length of the molded composite in the X-Y plane is less than or equal to 0.001.

79. (New) A bipolar plate formed from the composition of claim 66.

80. (New) A composite material for the manufacture of electrochemical cell components comprising:

a thermosetting resin system and 10 to 90 volume percent of a conductive filler, based on the total volume of the composite material, wherein the thermosetting resin system comprises a polybutadiene or polyisoprene resin, wherein the composite material has a volume resistivity of about 0.116 ohm-cm or less, and wherein an article molded from the composite material has a linear shrinkage per unit length of the molded composite in the X-Y plane of less than or equal to about 0.005.

81. (New) The composite material of Claim 80, further comprising an unsaturated butadiene- or isoprene-containing polymer, wherein a volume to volume ratio of the

polybutadiene or polyisoprene resin to the unsaturated butadiene- or isoprene-containing polymer is between 1:9 and 9:1, inclusive.

82. (New) The composite material of Claim 81, wherein the unsaturated butadiene- or isoprene-containing polymer is a styrene-butadiene or α-methyl styrene-butadiene di-block copolymer.

83. (New) The composite material of Claim 80, wherein the conductive filler is synthetic graphite.

84. (New) The composite material of Claim 80, wherein the polybutadiene or polyisoprene resin is liquid and has a molecular weight of less than 5,000.

85. (New) The composite material of Claim 80, further comprising an unsaturated butadiene- or isoprene-containing polymer, a low molecular weight polymer resin, and/or a crosslinking monomer with vinyl unsaturation.

86. (New) The composite material of Claim 80, wherein the composite material has a volume resistivity of about 0.08 ohm-cm or less and a thermal conductivity of at least about 5 watts/meter °K.

87. (New) The composite material of Claim 80, wherein the composite material has a volume resistivity of about 0.04 ohm-cm or less and a thermal conductivity of at least about 9 watts/meter °K.

88. (New) The composite material of claim 80, wherein the linear shrinkage per unit length of the article in the X-Y plane is less than or equal to about 0.003.

89. (New) The composite material of claim 80, wherein the linear shrinkage per unit length of the molded composite in the X-Y plane is less than or equal to 0.001.

90. (New) A bipolar plate formed from the composite material of claim 80.

91. (New) A composite material for the manufacture of electrochemical cell components comprising:

a thermosetting resin system and 10 to 90 volume percent of a conductive filler, based on the total volume of the composite material, wherein the thermosetting resin system comprises a liquid polybutadiene or polyisoprene resin having a molecular weight of less than about 5,000, and wherein the composite material has a volume resistivity of about 0.116 ohm-cm or less.

92. (New) The composite material of Claim 91, further comprising an unsaturated butadiene- or isoprene-containing polymer, wherein a volume to volume ratio of the polybutadiene or polyisoprene resin to the unsaturated butadiene- or isoprene-containing polymer is between 1:9 and 9:1, inclusive.

93. (New) The composite material of Claim 92, wherein the unsaturated butadiene- or isoprene-containing polymer is a styrene-butadiene or α-methyl styrene-butadiene di-block copolymer.

94. (New) The composite material of Claim 90, wherein the conductive filler is synthetic graphite.

95. (New) The composite material of Claim 90, further comprising an unsaturated butadiene- or isoprene-containing polymer, a low molecular weight polymer resin, and/or a crosslinking monomer with vinyl unsaturation.

96. (New) The composite material of Claim 90, wherein the composite material has a volume resistivity of about 0.08 ohm-cm or less and a thermal conductivity of at least about 5 watts/meter °K.

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97. (New) The composite material of Claim 90, wherein the composite material has a volume resistivity of about 0.04 ohm-cm or less and a thermal conductivity of at least about 7 watts/meter °K.

98. (New) An article molded from the composite material of Claim 90, wherein the article has a linear shrinkage per unit length of the molded composite in the X-Y plane of less than or equal to about 0.005.

99. (New) The article of Claim 98, wherein the linear shrinkage per unit length of the molded composite in the X-Y plane is less than or equal to about 0.003.

100. (New) The article of Claim 98, wherein the linear shrinkage per unit length of the molded composite in the X-Y plane is less than or equal to 0.001.

101. (New) A bipolar plate formed from the composite material of claim 90.

102. (New) A composite material for the manufacture of electrochemical cell components comprising:

a thermosetting resin system and about 10 to about 90 volume percent of a conductive filler, based on the total volume of the composite material, wherein the thermosetting resin system comprises a liquid polybutadiene or polyisoprene resin having a molecular weight of less than about 5,000, wherein the composite material has a thermal conductivity of at least about 5 watts/meter °K and a volume resistivity of about 0.116 ohm-cm or less, and wherein an article molded from the composite material has a linear shrinkage per unit length of the molded composite in the X-Y plane of less than or equal to about 0.005.

103. (New) The composite material of Claim 102, further comprising an unsaturated butadiene- or isoprene-containing polymer, wherein a volume to volume ratio of the

polybutadiene or polyisoprene resin to the unsaturated butadiene- or isoprene-containing polymer is between 1:9 and 9:1, inclusive.

104. (New) The composite material of Claim 103, wherein the unsaturated butadiene- or isoprene-containing polymer is a styrene-butadiene or α-methyl styrene-butadiene di-block copolymer.

105. (New) The composite material of Claim 102, wherein the conductive filler is synthetic graphite.

106. (New) The composite material of Claim 102, further comprising an organic peroxide curing agent.

107. (New) The composite material of Claim 102, wherein the polybutadiene or polyisoprene resin is liquid and has a molecular weight of about 1,000 to about 3,000.

108. (New) The composite material of Claim 102, further comprising a functionalized liquid polybutadiene or polyisoprene resin and/or a low molecular weight polymer resin and/or a crosslinking monomer with vinyl unsaturation.

109. (New) The composite material of Claim 102, wherein the composite material has a volume resistivity of about 0.08 ohm-cm or less and a thermal conductivity of at least about 7 watts/meter °K.

110. (New) The composite material of Claim 102, wherein the composite material has a volume resistivity of about 0.04 ohm-cm or less and thermal conductivity of at least about 9 watts/meter °K.

111. (New) The composite material of Claim 102, wherein the linear shrinkage per unit length of the molded composite in the X-Y plane is less than or equal to about 0.003.

112. (New) The composite material of Claim 102, wherein the linear shrinkage per unit length of the molded composite in the X-Y plane is less than or equal to 0.001.

113. (New) A bipolar plate formed from the composite of claim 102.